Mohamed Deraz Nasr

mderaznasr@gmail.com | +1 (613) 794-1005 | linkedin.com/in/mohderaznasr | github.com/MDerazNasr | scholar.google

Education

Georgia Institute of Technology | 3.9 GPA Jan 2026 – Dec 2027
Master of Science (M.Sc.) in Computer Science (Machine Learning Track)
Coursework (ongoing): Computer Vision, Deep Learning, Graphical/Generative Modeling, Reinforcement Learning

University of Ottawa | 3.7 GPA Sep 2020 – May 2025
Bachelor of Science (B.Sc.) in Software Engineering

Publications

Affinity Map: Few-Shot Protein Family Classification via Prototypical Networks Zenodo (2026)

- Published meta-learning study achieving **89%** 5-shot accuracy on unseen protein families using ESM-2 and LoRA fine-tuning.

Technical Skills

Programming Languages: Python, C++, CUDA, C, SQL, TypeScript, Bash, Go, Java
ML Frameworks/Data+Infra: PyTorch, TensorFlow, XGBoost, scikit-learn, Hugging Face, Transformers, JAX, LangChain, Airflow, MLflow, dbt, ONNX, TensorRT, Triton, NumPy, Pandas, SARIMA, GRPO, vLLM
Cloud & Infrastructure: Spark, AWS (EC2, Lambda), Ray, Kubernetes, Docker, BigQuery, Vertex AI, Kafka, Hadoop
Databases & Web Frameworks: PostgreSQL, Redis, MongoDB, DynamoDB, Next.js, Node.js, React, FastAPI, gRPC

Experience

Georgia Institute of Technology Remote
Machine Learning Researcher (Supervised by Dr. Adibi) *Jan 2026 – Present*

- Designing distributed **GPU-parallel MCTS** in **CUDA** with multi-node **Ray** workers and async inference weight sync via **Pytorch**
- Developing **MA-UCB**, a novel bandit algorithm with formal regret bounds for directing compute toward missing state variables
- Building **multi-encoder** pipeline fusing sensor streams into **semantic state space** for planning over incomplete observations.

Shopify Ottawa, Canada
Machine Learning Engineer Intern *Jan 2025 – Apr 2025*

- Prototyped **NLP** model **(PyTorch LLM)** to convert natural language to **SQL**, reducing querying time by **80%** for **1M+** records
- Built ML pipelines (**Python/Spark/SQL/Airflow**) forecasting business KPI metrics, improving prediction accuracy by **7%**
- Reduced model response time by **35% (Redis, Docker)** to optimize real-time **XGBoost** predictions for merchant dashboards

University of Ottawa Ottawa, Canada
Research Engineer Intern (Supervised by Dr. Kalonji) *Sep 2024 – Dec 2024*

- Deployed reinforcement learning retraining controller with EWMA drift detection & policy evaluation, cutting recompute **~40%**
- Engineered data pipelines **(Python/C++)** to process **200K+** solar readings daily with **80%** data coverage via **Redis** caching
- Deployed **Next.js/GraphQL** real-time dashboard with **XGBoost** forecasts to monitor model accuracy at **sub 200 ms** latency

March Networks Ottawa, Canada
Systems Engineer Intern *Jan 2023 – Apr 2023*

- Built **C**/**C++** diagnostic tool (**Python**/**Docker**) to debug **RTSP**/**WebSocket** failures on **Linux**, improving detection rate by **25%**
- Developed **Node.js/PostgreSQL** dashboard to track packet loss and performance across **200+** deployed camera networks

Projects

Equivariant Gaussian World Model – *Python, PyTorch, CUDA, e3nn, Equiformer V2, DINOv2, PyBullet* Jan 2026 – Present

- Creating SE(3)-equivariant object-centric 3D Gaussian world model fusing scene unifying, dynamics, & robot manipulation

FlowRT – *C++, CUDA 12.x, CUTLASS 3.x, ONNX Runtime, pybind11, PyTorch* Jan 2026 – Present

- Building inference engine (**Diffusion Policy, FLUX.1**) for **10x** lower latency vs PyTorch via INT8 quantization & persistent kernels

Protein Diffusion – *Python, PyTorch, C++, CUDA, Transformers, OpenFold API, RDKit* Oct 2025 – Dec 2025

- Built SE(3)-equivariant DDPM generating protein backbones in **~10s** with AlphaFold plausibility scoring, inspired by RFdiffusion

Reinforcement Learning F1 Sim – *PyTorch, Stable-Baselines3, Gymnasium, TensorBoard, Kubernetes* Aug 2025 – Oct 2025

- Designed F1 strategy sim with PPO & behavioral cloning; surpassing expert by **56%** in total race reward & **2x** baseline lap speed